ATTACHMENT C

Amendments to the Claims

1.-26. (Canceled)

27. (New) A synthetic Doppler location system comprising:

(i) at least two wireless transmitters, each of the transmitters including a revolving antenna situated at a known location outside an enclosed location and being operable to generate and transmit a synthetic Doppler shifted short spreading code signal having a period, wherein, to produce a synthetic Doppler shift, said antenna of each said transmitter is rotated in a circle in a horizontal direction at a rate related to the period of the spreading code signal, or each said transmitter sequentially switches said short spreading code signal to one of a plurality of antennas arranged in a circle at a rate related to the period of the spreading code signal;

(ii) a transceiver located inside said enclosed location for receiving said synthetic Doppler shifted short spreading code signal, said transceiver being configured to measure the time-of-arrival or time-difference-of-arrival of a first-to-arrive signal and an angle-of-transmission for each synthetic Doppler shifted spreading code signal received thereby to produce measured information and to forward the measured information to a processing means; and

(iii) said processing means being situated within said transceiver or disposed remotely from the transceiver and being configured to receive said measurement information from said transceiver, said processing means being further configured to compute a line-of-position of said transceiver, and to validate and to classify whether a first-to-arrive signal is a line-of-sight signal by comparing the computed line-of-position with the angle-of-transmission, and thereafter correcting a calculated location of said transceiver, if the first-to-arrive signal is not a line-of-sight based signal, on the measured time-of-transmission or time-difference-of-transmission and angle-of-transmission measurements, and prior knowledge of structural information with respect to the enclosed location.

28. (New) The location system as recited in claim 27 wherein a period of one revolution of the antenna of each said transmitter equals the period of said short spreading code signal.

29. (New) The location system as recited in claim 28 wherein each said transmitter is configured to establish a reference direction through a definition of a relationship between a code epoch of the short spreading code sequence and a reference Doppler shift corresponding to said reference direction from said transmitter.

30. (New) The location system as recited in claim 29 wherein each said transmitter rotates the axis of revolution of the corresponding said antenna to a horizontal direction.

31. (New) The location system as recited in claim 30 wherein the orientation of said axis of revolution of the antenna of each said transmitter is at a right angle with respect to the azimuthal angle-of-direction so as to create synthetic Doppler shift.

32. (New) The location system as recited in claim 27 wherein said transceiver is configured to measure phase difference between a synthetic Doppler shift signal and a code epoch of the short spreading code for determining the angle-of-transmission, and said transceiver comprises:

(i) a code synchronizer for synchronizing an incoming signal with a stored reference code using a real time correlator or a delayed lock loop;

(ii) a despreader for despreading the incoming signal;

(iii) a FM demodulator for producing a baseband-sinusoid corresponding to the instantaneous synthetic Doppler shift;

(iv) a positive zero crossing pulse train converter for converting positive zero crossings of the baseband-sinusoid; and

(v) a pulse train time difference detector for yielding a time difference between pulses of a synthetic Doppler shift pulse train and pulses of a code-epoch pulse train.

33. (New) The location system as recited in claim 32 wherein said transceiver is further configured to measure time-of-arrival of said spreading code signal from one said transmitter or time-difference-of-arrival for two said transmitters by using a search correlator processing said spreading code.

34. (New) The location system as recited in claim 27 wherein said transceiver is configured to measure a peak-to-peak Doppler shift of said spreading code signal.

35. (New) The location system as recited in claim 34 wherein said processing means computes a vertical component directly based on the reduction of said peak-to-peak Doppler shift of said spreading code by a cosine of an elevation of said transceiver.

36. (New) The location system as recited in claim 30 wherein said processing means determines an elevation of said transceiver based on angle-of-transmission while the antenna of each said transmitter is rotated vertically in a circle.

37. (New) The location system as recited in claim 27 wherein said enclosed location is a building interior.

38. (New) A method of determining a location of a transceiver comprising:

(i) transmitting a synthetic Doppler shift short spreading code signal, having a period, from at least two transmitters each including revolving antenna situated at a known location outside of an enclosed location, wherein the antenna of each said transmitter is rotated in a circle in a horizontal direction at a rate related to the period of the spreading code signal or each said transmitter sequentially switches said short spreading code signal to one of a plurality of antennas arranged in a circle at a rate related to the period of the spreading code signal;

(ii) receiving at a transceiver, on a first-to-arrive basis, said synthetic Doppler shift spreading code signal from each of said transmitters, wherein said transceiver is

configured to measure a time-of-arrival of the spreading code signal from each of said transmitters;

(iii) measuring an angle-of-transmission based on a time difference between a maximum positive peak of the synthetic Doppler shift signal and a code epoch of said spreading code measured at said transceiver;

(iv) forwarding a measured time-of-arrival or a measured time-difference-of-arrival transmission and a measured angle-of-transmission from said transceiver to a processing means;

(v) determining, at said processing means, a line-of-position from time-of-arrival or time-difference-of-arrival data from the first-to-arrive signal based on the transmissions from said transceiver;

(vi) validating and classifying whether the first-to-arrive signal is a line-of-sight signal based on a comparison of the determined line-of-position with the measured angle-of-transmission; and

(vii) determining the location of said transceiver using prior knowledge of structural information regarding the enclosed location, if the first-to-arrive signal is not the line-of-sight signal.

39. (New) The method as recited in claim 38 further comprising:

(i) examining, at said processing means, the peak-to-peak of Doppler shift of said signal measured at said transceiver to determine a vertical component in the location data; and

(ii) transmitting, from said transmitter, said synthetic Doppler shift spreading code signal wherein the period of said short spreading code signal is integrally related to a period of vertical revolution of the corresponding antenna.

40. (New) The method as recited in claim 38 wherein a period of one revolution of said antenna of each said transmitter is integrally related to the period of said short spreading code signal.

41. (New) The method as recited in claim 38 wherein each said transmitter is configured to establish a reference direction through a definition of a relationship between the code epoch of short spreading code sequence and a reference Doppler shift corresponding to the reference direction from said transmitter.

42. (New) The method as recited in claim 38 wherein said transceiver is configured to measure a phase difference between the synthetic Doppler shift signal and the code epoch of spreading code for determining the angle-of-transmission, and the transceiver comprises:

(i) a code synchronizer for synchronizing an incoming signal with a stored reference code using a real time correlator or a delayed lock loop;

(ii) a despreader for dispreading the incoming signal;

(iii) a FM demodulator for producing a baseband-sinusoid corresponding to the instantaneous synthetic Doppler shift;

(iv) a positive zero crossing pulse train converter for converting positive zero crossings of the baseband-sinusoid; and

(v) a pulse train time difference detector for yielding a time difference between pulses of a synthetic Doppler shift pulse train and pulses of a code epoch pulse train.

43. (New) The method as recited in claim 38 wherein said transceiver is further configured to measure a time-of-arrival of said spreading code signal from one said transmitter or a time-difference-of-arrival for two said transmitters by using a search correlator processing said spreading code.

44. (New) The method as recited in claim 38 wherein said transceiver is further configured to measure the peak-to-peak Doppler shift of said spreading code signal.

45. (New) The method as recited in claim 39 wherein each said transmitter is configured to establish a reference direction through a definition of a relationship

between a beginning point of short spreading code sequence and a reference Doppler shift corresponding to the reference direction from said transmitter.

46. (New) The method as recited in claim 39 wherein each said transmitter rotates the axis of revolution of said antenna to a horizontal direction.

47. (New) The method as recited in claim 46 wherein the orientation of said axis of revolution of said antenna of said transmitter is at a right angle with respect to the azimuthally angle-of-transmission.

48. (New) The method as recited in claim 39 wherein said transceiver is further configured to measure a time-of-arrival of said spreading code signal from one said transmitter or a time-difference-of-arrival for two said transmitters by using a search correlator processing said short spreading code.

49. (New) The method as recited in claim 48 wherein said processing determines an elevation of said transceiver based on an angle-of-transmission while the antenna of each said transmitter is rotated vertically in a circle.

50. (New) The method as recited in claim 38 wherein said enclosed location is a building interior.